Journal of Applied Finance & Banking, Vol. 16, No. 4, 2026, 115-149
ISSN: 1792-6580 (print version), 1792-6599(online)
https://doi.org/10.47260/jafb/1645
Scientific Press International Limited

Reflection of the Black-Scholes Model through Factoring

Md. Moniruzzaman[1], Annuar Md. Nassir[2], Mohd Padzil Hashim[3] and Susela Devi K Suppiah[4]

Abstract

Financing through factoring depends on the creditworthiness of trade receivables (TRs). The creditworthiness of TRs depends on credit rating of the debtor (buying firms); credit period; quality, kind and nature of the goods and services delivered; category of goods (perishable, non- perishable); strength of regulatory framework in the country; etc. All these influence the amount and terms of conditions of financing through factoring. The same principle happens in financing through derivative contract influenced by the underlined assets which is explained by the Black- Scholes model. The amount of financing through option contract under Black-Scholes theory is the function of the underlined asset, time to maturity, exercise price, risk free interest rate, volatility of asset price, etc. Thus this study finds a relevance of Black-Scholes model with financing through factoring. This study has assessed the impact of financing through factoring influenced by Black-Scholes model (BSM) in terms of return on assets (ROA), return on equity (ROE), current ratio (CR), internal growth rate (IGR), and sustainable growth rate (SGR). The study is a reflection of BSM through factoring. The study has used TRs as mediator. With reference to previous imperial studies and industry practices, four types of business expenses such as payments of purchases (P), salary and wages (SW), overhead (OH) expenses, and sales administration (SA) expenses that are commonly financed through factoring have been used as the explanatory variables in the study. The empirical models used in the study to measure the effect are of multiple regression. The models used the panel data consisting of 5400 firm year observations of 2014 – 2019. This paper is a reflection of a financial theory (BSM) theory through the application of a financial model (factoring).

JEL classification numbers: G0, G2, G3, G30, G300, G32, O0, O1, O12.
Keywords: Black-Scholes Model, Factoring, Trade Receivables, ROA, ROE, CR, IGR, SGR.

---

[1] Associate Professor of Finance, College of Business Administration, IUBAT - International University of Business Agriculture and Technology, Dhaka, Bangladesh.
[2] Professor of Finance, School of Business and Social Sciences, Albukhary International University, Malaysia.
[3] Putra Business School, Universiti Putra Malaysia, Malaysia.
[4] Faculty of Business and Accountancy, Universiti Selangor, Malaysia.

Article Info: *Received:* February 14, 2026. *Revised:* May 1, 2026.
Published online: June 10, 2026.

1. Introduction

Financing through Factoring depends on the creditworthiness of receivables represented by invoices. The creditworthiness of the invoices is the function of (i) the financial strength of the company (called "debtor" in factoring model of financing); (ii) financial strength of the supplying or selling company (called "client" in the same mode of financing, i.e., factoring); (iii) credit period during which the financed amount is repaid by the client, generally longer credit period, (iv) the more non-intention on the part of the factor (the bank or financial institution or factoring company that finance invoices) to finance the invoices; (v) the nature of the goods and/or services being traded between debtor and client (if the goods are perishable or non-traceable, it increases the risk for the factor); etc.

On the other, in Black-Scholes model, the financing through a derivative instrument such as option contract is influenced by the creditworthiness of the underlined assets. In this model, the price of a derivative contract (whether it is a put option or call option) is the function of a number of factors such as underlined asset price, time to maturity, exercise price, risk free interest rate, volatility of asset price, etc. Besides the financial assets or security, the underlined asset may also be any physical commodity like crude oil, wheat, rice, sugar, corn, pepper, silver, cotton, etc. or any financial security like share, bond, equity index, etc. (Srivastava & Shastri, 2018).

In both factoring and Black-Scholes model, there are some underlined issues that influence the investment-worthiness of the assets: in factoring it is the invoice which is induced by creditworthiness of the debtor and client; credit period, nature of goods, etc. and in Black-Scholes model (BSM), the derivative contract is influenced by the strike price of the option, the current stock price, the time to expiration, the risk-free rate, and the volatility in the market. This shows a common feature and similarity between two vehicles of financing: factoring and BSM. During the PhD research, the author found this hidden similarity when he was conducting the Literature Review.

The paper measures the performance of a firm using the finance through factoring. Indirectly, this performance-measurement is also a reflection of BSM. The proxies of the performance include return on assets (ROA), return on equity (ROE), current ratio (CR), internal growth rate (IGR) and sustainable growth rate (SGR). The paper indicates a reflection of Black-Scholes model through profitability (ROA, ROE); liquidity strength (CR); and sustainability (IGR, SGR) of the firms using financing through factoring. In this way, it paves that it is an expression of BSM through factoring.

The paper includes a data-background showing the volume of financing through factoring. It indicates the volume of financing being executed under Black-Scholes model through factoring. The global volume of factoring has been shown here following a deductive approach: showing the data from the perspectives of global, then regional, then national. It means that the data represent the application of Black-Scholes Model (BSM) globally, regionally and domestically through factoring. As of the end of 2019, the market stood USD 3,262.59 billion globally as

shown in Table 1; USD 771.44 billion regionally (Asia-Pacific) as shown in Table 2; USD 0.1023 billion locally (in the country, Bangladesh) as shown in Table 3 (FCI, 2019; IDLC, 2019; Market Pulse, 2018; Author's Visit to the Factors, 2020).
Globally, Europe represents the highest market position of factoring (meaning the market of BSM) followed by the Asia-Pacific securing the second position as shown in Figure 1. In the region (Asia-Pacific), the first position is usually always held by Mainland China followed by Australia; Taiwan; Japan; and Hong Kong, SAR (Special Administrative Region), China as shown in Table 2. Locally, the market is led by the non- bank financial institutions (NBFIs) as shown in Table 3. Recently, some top-notch banks namely Eastern Bank Limited, Bank Asia Limited, BRAC Bank Limited, The City Bank Limited have also started this invoice (receivables) based financing.

Table 1: Global Factoring Markets as of 31 December, 2019

Regions	Domestic	International	Total
Africa	23.23	4.33	**Total**
Asia-Pacific	613.09	158.39	27.56
Europe	1,787.11	430.23	771.48
Middle East	7.99	3.16	2,217.34
North America	90.11	7.22	11.15
South America	133.28	4.46	97.32
Total	**2,654.80**	**607.79**	**137.74**

Source: Author's own calculations using the data from FCI Annual Review (2019).
Note: The volume was in Euro. It was converted into USD at the exchange rates shown as of 31 December of the respective year(s). The source of exchange rates is www.poundsterlinglive.com [Accessed 21 July 2019; 28 February 2020].

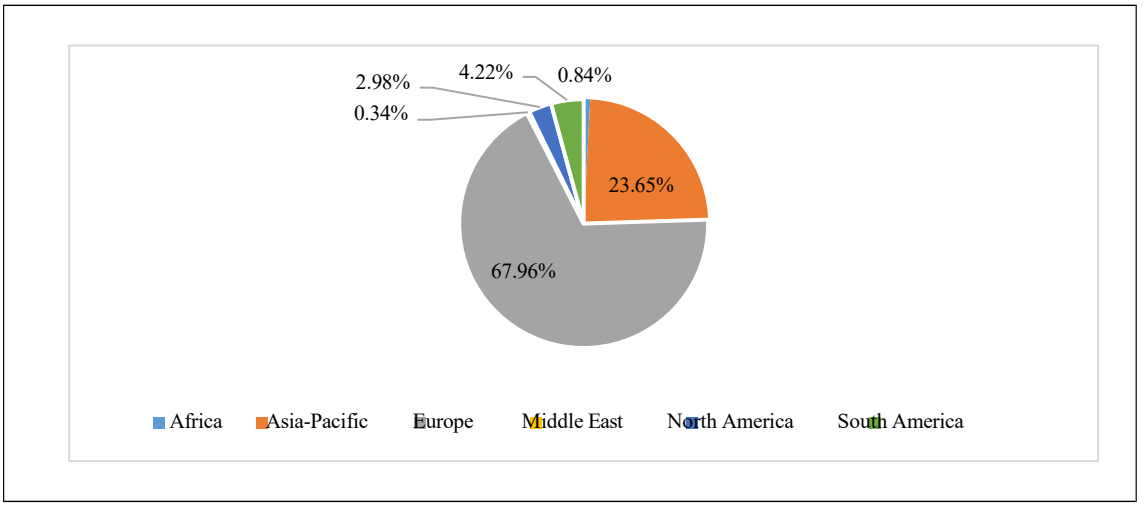

Figure 1: Factoring Concentration by Region as of 31 December, 2019

Source: Author's own calculations using the data from FCI Annual Review (2019).

Global as well as regional markets include both domestic and international factoring. It means that BSM is used in both forms: domestic and international. The volume of domestic factoring (i.e. the use of BS model in domestic form) is higher than that of international factoring (i.e. BSM in international form) as shown in Figure 2. However, the year-over-year growth rate of both categories of factoring is mixed as over the last 10 years since 2010 as shown in Figure 3. Initially, the growth of domestic factoring was higher than that of international factoring, then the growth rate of international factoring was higher until the mid of 2015, and then again the growth of domestic factoring registered at higher rate than international factoring until the end of 2019.

Table 2: Factoring Volume by Country in the Region: Asia-Pacific (Billions of USD**)**

Countries	Year									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Australia	60.28	74.46	65.48	55.40	51.34	45.44	50.37	57.24	62.48	60.96
China	207.41	354.48	453.76	521.06	493.01	383.93	318.83	487.05	473.31	452.73
Hong Kong	19.32	22.52	38.73	44.44	37.39	36.37	45.11	56.38	61.53	54.02
India	3.69	3.63	4.82	7.22	5.27	4.03	4.10	5.13	5.21	5.71
Indonesia	-	0.00	0.00	1.13	0.98	0.74	0.72	0.82	-	0.51
Japan	132.19	144.08	128.32	106.46	62.00	58.95	52.29	44.78	56.75	55.48
Kazakhstan	-	-	-	-	-	0.12	0.11	0.13	-	-
Korea	6.82	10.47	10.56	17.01	15.43	14.25	14.95	15.73	29.49	30.21
Malaysia	1.42	1.36	2.35	2.46	2.16	0.36	1.61	1.98	5.13	5.00
Singapore	7.78	8.64	11.44	13.74	45.94	42.32	42.81	52.84	50.60	44.43
Sri Lanka	-	-	-	-	0.05	0.13	0.12	0.14	-	0.22
Taiwan	89.91	103.36	92.40	100.59	68.81	57.33	49.88	59.51	47.38	54.33
Thailand	2.81	3.99	5.73	4.61	5.03	4.80	5.60	6.73	6.76	6.59
Vietnam	0.09	0.09	0.08	0.14	0.12	0.36	0.70	0.84	1.27	1.23
Total	531.72	727.09	813.68	874.26	787.54	649.12	587.20	789.28	799.90	771.44

Source: Author's own calculations using the data from FCI Annual Review (2017, 2018, 2019, 2020).
Note: Same as under Table 1.

Table 3: Factoring Portfolio in Bangladesh

Factors	As of November, 2018		As of April, 2019		As of December, 2019	
	BDT Billion	**USD Billion**	**BDT Billion**	**USD Billion**	**BDT Billion**	**USD Billion**
IPDC Finance Ltd.	1.80	0.02	2.40	0.029	3.20	0.04
Lanka Bangla Finance Ltd.	1.55	0.02	1.51	0.018	1.26	0.02
United Finance Ltd.	1.30	0.02	1.35	0.016	1.20	0.01
IDLC Finance Ltd	0.74	0.01	0.59	0.007	1.14	0.01
Others	0.61	0.01	0.29	0.004	1.72	0.02
Total	6.00	0.08	6.14	0.074	8.52	0.10

Source: Author's own calculations using the data from IDLC Monthly Business Review (2018), Market Pulse (2019), Author's Visit to the Factors (February, 2020).
Note: The Exchange Rate between BDT and USD is as of the Last Day (Closing Price) of the Respective Month.

The compound annual growth rate (CAGR) of domestic factoring is lower than that of international factoring registering at 3.95% and 7.03% respectively as shown in Figure 3 (FCI 2017, 2018, 2019). In Bangladesh market, two factors namely Tradewind and Primadollar are operating international factoring having outstanding portfolio USD 0.220 billion as of the end December, 2019 (Author's Visit to the Factors, 2020). It means that BSM is also being implemented by the international factors in Bangladesh.

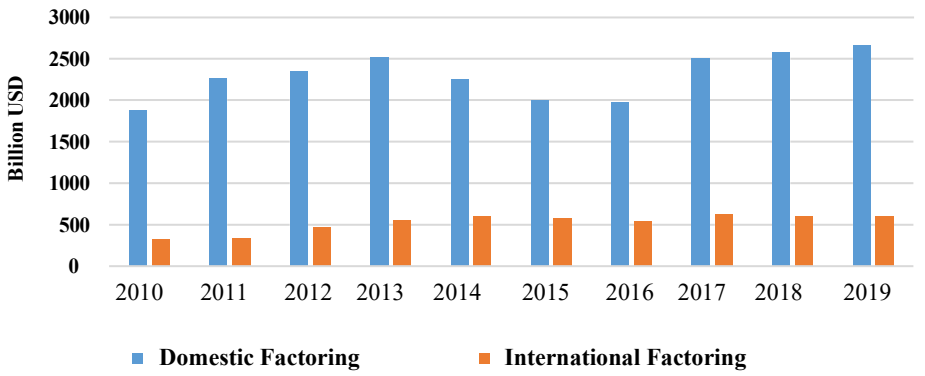

Figure 2: Volume of Domestic and International Factoring

Source: Author's own calculations using the data FCI Annual Review (2017, 2018, 2019).

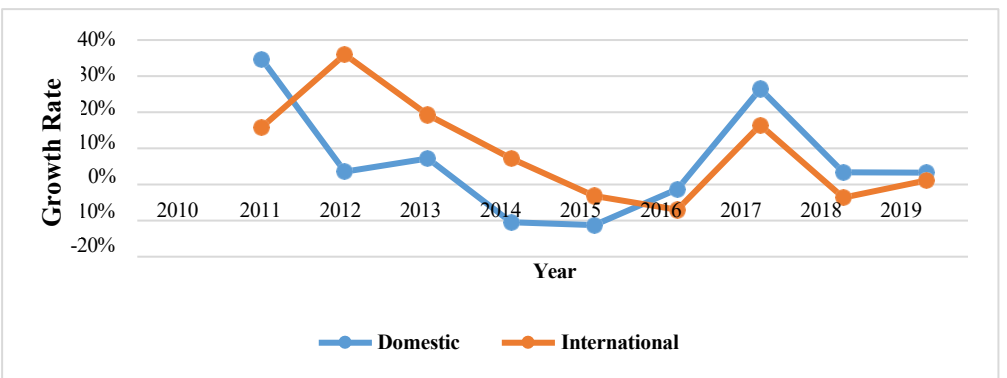

Figure 3: Year-over-Year Growth between Domestic and International Factoring

Source: Author's own calculations using the data from FCI Annual Review (2017, 2018, 2019).

This invoices based market or trade receivables (TRs) based market is on increasing trend (Davis & Chen, 2014; Janekova, 2012; Benea & Duma, 2013). In other words, the use of BSM through factoring is on increasing trend. In terms of the percentage of global GDP, this market is growing globally as shown in Figure 4. The global year over year growth of this market is also higher than that of global GDP as shown in Figure 5 having CAGRs at 5.232% and 2.967% respectively over the last 12 years since 2008 (World Bank, 2019; FCI, 2019). This market as a portion of GDP in the neighboring countries of Bangladesh is shown in Table 4. This market is only 0.106% of GDP in Bangladesh as of the end of 2019, including both domestic and international factoring (World Bank, 2019; Author's Visit to the Factors, 2020).

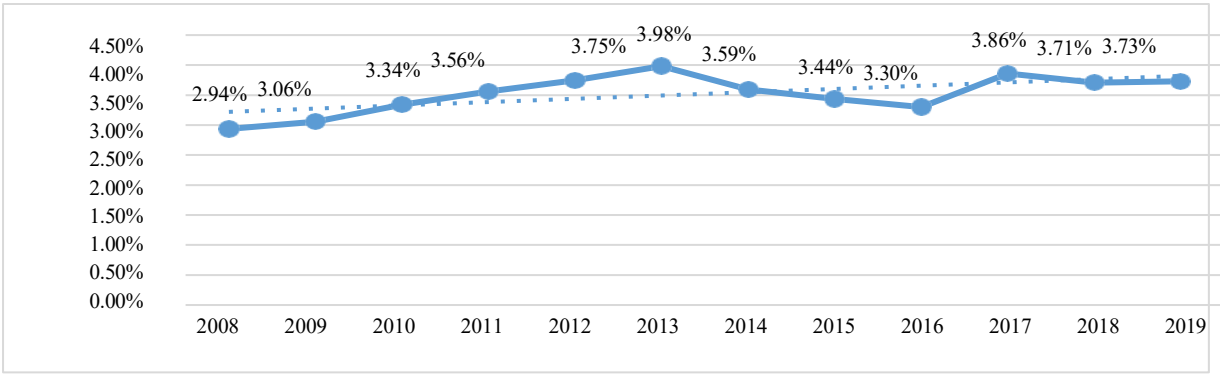

Figure 4: Global Factoring as Percentage of World GDP

Source: Author's own calculations using the data from World Bank (2017, 2018, 2019, 2020); FCI (2017, 2018, 2019, 2020).

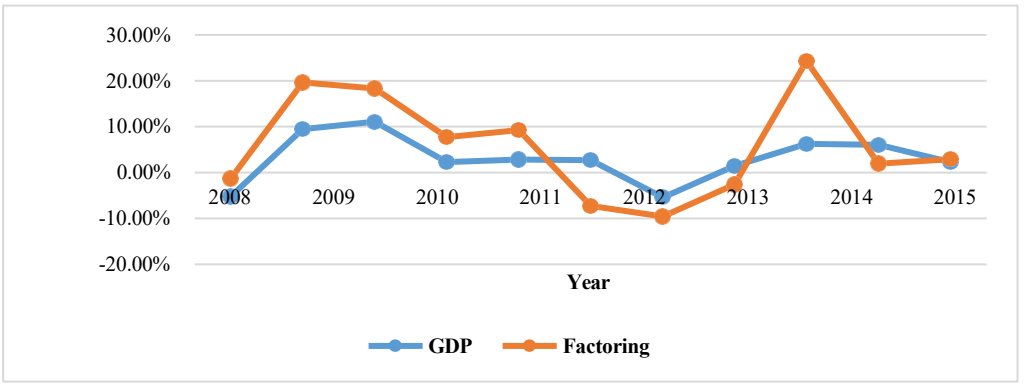

Figure 5: Year over Year Growth of World GDP and Global Factoring

Source: Author's own calculations using the data World Bank (2019, 2020); FCI (2017, 2018, 2019, 2020).

Thus, depending on a number of factors, there is a variation in the amount of financing through factoring from country to country, region to region, even within a single country. This variation of financing through factoring finds a relation with BSM which defines the variation of financing due to the creditworthiness of the option contracts backed by the underlined assets (Srivastava & Shastri, 2018). BSM states that the price of an option contract changes (increases or decreases) in future due to the prices (the spot prices) of the underlying assets. It also happens in financing through factoring: the amount of financing depends on the creditworthiness of TRs. The credit worthiness of TRs is the function of a number of determinants such as credit period of TRs, credit report of the debtors of TRs, discount rate of TRs, interest rate, rate of factoring fees, etc. In this way, the paper finds a similarity between factoring and BSM and the reflection of BSM through factoring.

Table 4: Factoring as Parentage of GDP in Neighboring Countries of Bangladesh

Countries	Year									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
India	0.22%	0.20%	0.26%	0.39%	0.26%	0.19%	0.18%	0.19%	0.19%	0.20%
Malaysia	0.56%	0.46%	0.75%	0.76%	0.64%	0.12%	0.54%	0.62%	1.43%	1.37%
Singapore	3.25%	3.09%	3.88%	4.47%	14.59%	13.74%	13.43%	15.46%	13.56%	11.94%
Vietnam	0.08%	0.06%	0.05%	0.08%	0.07%	0.19%	0.34%	0.38%	0.52%	0.47%
China	3.41%	4.69%	5.32%	5.44%	4.71%	3.47%	2.84%	3.96%	3.41%	3.16%
HKSARC	8.45%	9.06%	14.75%	16.12%	12.83%	11.75%	14.06%	16.52%	17.01%	14.76%

Source: Author's own calculations using the data of World Bank (2019, 2020), FCI Annual Review (2017, 2018, 2019).
Note: HK, SAC stands for Hong Kong, Special Administrative Region, China

1.1 BSM as a Growth Factor for a Firm through Factoring

Many factors influence financial growth of a firm. For instance, Ayako, Githui, & Kungu, (2015) emphasized on the board of directors as a key determinant of company performance and financial health. On the other han2d, Drever and Hutchinson (2007) state that liquidity is crucial for a firm's financial health. Factoring brings this liquidity through the encashment of TRs. Factoring accelerates the growth of the firms through the encashment of TRs. Factoring is a growth-financing option. It helps to build capacity, to compete, to create jobs, to expand business. It has the strategic value to contribute to the financial growth of the companies (Emery, 1988; Brick & Fung, 1984; Schwartz, 1974; Srivastava & Shastri, 2018).

The encashment of TRs through factoring provides short-term finances for the firms (Cela, Shkurti, & Hilaj, 2013). The short-term finances are the pillars of long-terms assets. Short-term finance helps in proper utilization of invested capital to ensure financial growth of the firm (Ropega, 2011). Company's business growth is the function of the availability of resources. It needs upfront investment. The CEO or owner of the firm always fight to make balance among time, attention, and resources

(Govindarajan, 2011) for financial growth of the company. The availability of resources is the common factor for growth of the companies. The most required resource is the financial resource and it is in the form of liquidity (cash flow).
Firms need funds timely to capitalize business opportunities. They can realize the business opportunities through factoring existing invoices. They may opt for factoring as an alternative source of fund, even sometimes as substitute of bank loan to manage liquidity more efficiently to harness profitability (Beck et al., 2006; Benea & Duma, 2013). Since the paper incorporates the application of BSM through factoring, BSM also work as growth factor for a firm in the dress of factoring.

1.2 Payments Made by Factoring: Payments Made through BSM

Based on the most use by the firms including the study-firms as well as the findings of the previous studies, the categories of payments that are financed commonly through factoring have been classified under four heads: financing the payments of (i) raw materials purchased, (ii) salaries and wages accrued, (iii) overhead expenses incurred, and (iv) sales administration expenses due (Brealey & Myers, 1991, 2000; Carson et al., 1995; Hodgetts & Kuratko, 1995; Holmlund & Kock, 1998). Indirectly, these payments are made through BSM. These four types of financing have been labelled in the study as P, SW, OH, and SA respectively and they have worked as explanatory variables. This study has picked P, SW, OH, and SA to find the direct impact of financing (the payment of raw materials purchased, salaries and wages accrued, overhead expenses incurred, and sales administration expenses accrued) by the encashment of TRs through factoring on the financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit as depicted in Figure 6. In other words, the paper measures the reflection of BSM through factoring.
The rest of the paper is organized as follows: section 2 provides literature review covering both underpinning theories and previous empirical research works, section 3 presents research method used in the study, section 4 describes the results found in the study, section 5 interprets the results, section 6 provides the implications of the study followed by the conclusion in section 7.

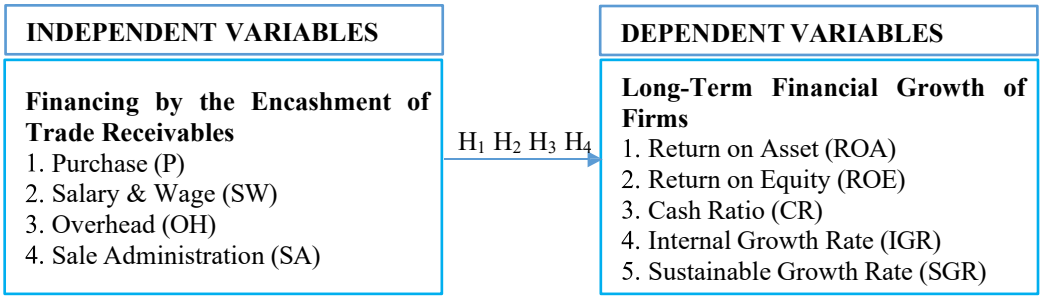

Figure 6: Research Framework

Source: The Author (2022).

2. Literature Review

2.1 Theoretical Review

As glimpsed in the title, this study is influenced by the Black-Scholes Options Pricing Model. The model was developed by Fischer Black and Myron Scholes in 1973 being published in the paper "The Pricing of Options and Corporate Liabilities" in the Journal of "Political Economy" (Black & Scholes, 1973). It is a landmark theory in the field of financial engineering, especially in the derivative field. The theory was formulated to price option contract which is one of the major derivatives: forwards, futures, options, and swaps. A derivative is financial instrument that derives its value from the underline assets. An option is a financial contract based on an underlined asset in which the buyer gets a right but not obligation to buy or sell a specified quantity of the underlined asset at a specified price called strike price on or before a specific date termed the expiry date. The underlined asset may be any physical commodity like crude oil, wheat, rice, sugar, corn, pepper, silver, cotton, etc. or any financial security like share, bond, equity index, etc. (Srivastava & Shastri, 2018; Ivanovic et al., 2011).

There are two types of options like call option and put option. The call option provides the right not the obligation to buy to the buyer whereas the put option provides the right not the obligation to sell. There are two types of options: American style option, and European style option. The Black-Scholes model was devised based on the European style option since it is exercised at the maturity (expiry) date of the option whereas American style option can be exercised at any time before the expiry date.

Black-Scholes Model depends on some assumptions to price an option such as spot price of the underline assets; duration of the derivative contract (the maturity period of the option contract, it is the short-term period); price volatility of the underline assets; risk free rate of return in the market (fixed interest rate); no dividend payment; no buying or selling options; no abilities to borrow and conduct short sell; etc. (Versluis & Hillegers, 2006).

2.2 Empirical Literature Review

This section provides previous researches on TRs, and their link with factoring as well as BSM.

Mbula et al. (2016) found TRs play a major role on the profitability of firms. They got positive impact of effective working capital management on the profitability of the firms. TRs are a major component of working capital (Brealey & Myers, 2000; Banos-Caballero et al., 2012; Deloof, 2003; Bhattacharya, 2010). Mbula et al. (2016) suggested factoring as an effective tool for managing trade receivables. However, this financing is influenced by the position of TRs such as creditworthiness of the debtors (against which the TRs have been issued), trade credit period within which the TRs will be paid by the debtors, quality and nature of the products delivered to the debtors (for instance, the perishable products are not entertained in factoring), liquidity position of the supplier (generally a cash-rich supplier doesn't get inclined

in factoring), etc. The same principle happens in BSM wherein the financial Drever contract under derivative agreement, the issues like the assets on which agreement is conducted, duration for which the agreement is made, rate of interest, risk free return, etc. In this way, there is a legacy between factoring and BSM.

Yong and Gui-Fen (2016) termed receivable financing as enterprise financing. Factoring turns a firm from passive into active form. They found a variation in getting finance through factoring due to quality of products or services sold, credit worthiness of the debtors, raw materials used in manufacturing the products, etc. All these influence the level of financing through factoring. Analogically such issues also work in BSM. Financial strength as well as the nature of the asset on which the option contract is being formulated, term to maturity of the contract, rate of interest on bond which is the risk-free asset or security, etc. work as the underlying factors in BSM. In this way, it resembles an influence between BSM and factoring.

Qi-Chang and Yuan (2016) have shown that lack of proper attention to the management of TRs is the main reason of financial difficulty of the middle-small companies in China. They suggested factoring as an alternative financial modality for small firms so that they can get funds within their capability. However, this financing is varied by the financial strength of the invoices. It means that financial credibility of invoices work as the underlined asset in factoring as happens (underlined asset influence) in BSM in determining the price of the derivative contract. In other words, the invoices financially strong positively influence (in amount, rate of interest, terms of conditions, etc.) in getting finance in factoring as happens in BSM: the underlined assets (physical commodities, financial instruments, etc.) influence the terms of conditions in raising fund through derivative contract.

Makori and Jagongo (2013) found a firm can create value for the shareholders by reducing days of accounts receivables. In this case, factoring may help in shortening credit period by converting invoices into cash just after the sales made on credit. This credit-period shortening with factoring depends on the credibility of the invoices representing the evidence of the credit-sales. The factor generally doesn't consider all the invoices equally. The credit sales against the blue-chip corporate debtor can easily be factored; the invoices against the financially weak debtors may not even be considered by the factor. So, the invoices work as the underlined variable in getting finance within short time in factoring. In BSM, with the underlined assets, specially in the case of financial instrument (asset), the input "time to expiration of the contract" work as one of the influencing issue in determining the price of the derivative contract. In this way, this study finds a relationship between factoring and BSM.

Hoti (2014) found financing through factoring is helpful for start-ups and young firms in the developed economies. He also found a fluctuations in this financing due to the strength of invoices that is measured by the payment history of debtors, terms of credit period, brand of the debtors, etc. In BSM, the price of the instrument is fluctuated by the underlined issues such as volatility in the price of assets, type of

the assets, underlying stock price, strike price, time, and risk-free rate, etc. In this context, this study finds a relation between BSM and financing through factoring.

Klapper (2006, 2005, 2000) did a landmark on factoring from World Bank. She emphasized on the use of factoring receivables by the SMEs. She narrated it as a new technology to access to short-term finance for SMEs. The specialty of this financing is that the eligibility of the firms (to get credit) depends on the value of the receivables. The value of the receivables depend on the creditworthiness of the large corporates to whom the receivables are drawn for selling goods and/or services to them (large corporates) on credit, not on the creditworthiness of the firms selling the same (goods and/or services) on credit. She suggested extensive use of factoring trade receivables for the solution of liquidity crisis. Klapper (2006, 2005, 2000) found the creditworthiness of the debtors as the determining factor (variable) in getting finance. Similarly, the creditworthiness of the assets covered under BSM work as the determining factor in getting finance and valuing the derivative instrument.

Kirkby (1976) conducted a classical study on factoring industry based on the UK market. Kirkby suggested to penetrate the use of factoring. He found fluctuation on the use of factoring in regard to quality and volume of invoices, credit worthiness of debtors, and legal framework in the state. The study considers these factors (or issues or variables) as the linkage with BSM where price volatility, type, market price, etc. of the underlined assets; strike price of the derivative contract; duration of the contract; risk-free rate; etc. work as determining factors in valuing a financial instrument.

Soufani (2002, 2001) found a positive impact on the growth of the firms using factoring in UK. He found factoring helps firms improve cash flow, working capital position and overall development. He also found that the use of receivable financing varies from firm to firm depending on the creditworthiness of invoices, nature of business of the firms, etc. This leads to the relation between BMS and financing through factoring.

Perman (1984) prepared a famous write up on factoring based on the US market. He described factoring as the passport of financial freedom. He noted that factoring does not only provide liquidity to the business, it also helps how to make efficient use of money, expand sales, rise income and profit. And all these a factoring company does without any participation in the equity of the firm. It considers the financial strength of the invoices. Perman (1984) found that the variation in the use of invoices in financing the operations of a firm depends on creditworthiness the same (invoices). This model of financing also works in BSM where the financing amount depends on the value of the underlined assets. This shows a legacy between factoring and BSM.

Table 5: Summary of the Empirical Study

Authors	Country/ Institute	Issues	Findings
Mbula et al. (2016)	Kenya	Relationship between management of accounts receivable and financial performance of the firms	Effective management of TRs impacts efficiency level of working capital. And working capital can be managed effectively with the help of factoring. Volume of factoring depends on the creditworthiness of TRs which work as the underlined determinant that also happens in BSM wherein the assets or commodity which the option contract is prepared, duration of the contract, rate of interest, risk free rate of return, etc. work as the underlined factors or issues.
Yong & Gui-Fen (2016)	China	Accounts receivable financing and liquidity performance of companies	TRs influence liquidity position of enterprises through factoring positively. Factoring varies with financial health of the underlined assets called trade receivables. Similarly, in BSM the financial strength of the asset on which the option contract is prepared, maturity period of the contract, rate of interest on bond, etc. work as the underlying factors.
Qi-Chang & Yuan (2016)	China	Receivable management and financial performance of middle-small companies	TRs are indicated to use factoring to improve financial performance. The financial credibility (creditworthiness of TRs) work as the determining factor for liquidity support through factoring. Similarly, the creditworthiness of the underlined asset as the determining factor of pricing an option contract in BSM.
Makori & Jagongo (2013)	Kenya	Working capital Management and profitability of companies	Shareholders' wealth can be enhanced by reducing credit or payment period of accounts receivable through factoring. Similarly in BSM, the time to expiration of the underlined contract influence the credit support.
Hoti (2014)	Albania	Start-ups and young firms are benefitted with factoring	Factoring is helpful for young and start-up firms which lack collateral. TRs are used as collateral in factoring. In BSM, the underlined assets work as the collateral against the credit support.
Klapper (2006, 2005, 2000)	World Bank	Role of factoring for small companies	Factoring is described as a technology to enhance cash flow of small firms. Invoices enhance the efficiency of this financial technology. BSM also works as a new technology to price a financial contract to improve the cash flow position of a firm or individual as an investor.

Kirkby (1976)	UK	Penetration of factoring	Firms are suggested to offer more TRs to take factoring in a greater amount. Banks and financial institutions are also suggested to consider accounts receivables as a credit worthy asset. Banks and financial institutions may also apply BSM to determine the value of TRs to consider them as collateral. Because, TRs work as a collateral in factoring.
Soufani (2002, 2001)	UK	Impact of factoring	Firms are suggested to consider factoring as an option of short-term finance. Firms are also suggested to increase the amount of credit worthy invoices to facilitate the process of factoring services. Similarly in BSM, the underlined assets influence the designing of short-term finance. It is noted that both factoring and derivative contract in BSM are short-term finance.
Perman (1984)	USA	Factoring as a source of finance	Factoring is termed as a passport of financial freedom considering TRs as collateral of the credit. In BSM, the underlined asset may work as collateral and provide the financial passport to the borrower.

3. Research Methodology

3.1 Empirical Models

The general model followed in the study is as follows:

$$Yit = \alpha + Xit\beta + uit \tag{3.1}$$

where:
Yit is the dependent variable representing the value of *i*th firm at time *t*. *i* refers to firms, in the study *i* varies from 1st firm to 75th firm, i.e. $i = 1$ 75. *t* refers to the time period, in the study $t = 2014$ ……2019. *Xit* is the vector of independent variables. βs are the slope coefficients estimated, α is an intercept or a constant term, and *uit* is disturbance or error term.

3.2 Effect Measurement Model

The general econometric model is now expanded to measure the effect of BSM through factoring. The effect has been measured with the help of four independent variables. These variables include financing the payment of (i) purchase, (ii) salaries and wages, (iii) overheads and (iv) sales administration (or sales processing) expenses. There are five proxies in the study as mentioned in section 1. In the original study, there were two moderators namely E (Equity) and S (Sales Turnover) and a mediator namely CA (Current Assets). The equations are as follows:

$$ROA = \alpha + \beta_1 P_{it} + \beta_2 SW_{it} + \beta_3 OH_{it} + \beta_4 SA_{it} + \beta_5 E_{it} + \beta_6 S_{it} + u_{it} \tag{3.2}$$
$$ROE = \alpha + \beta_1 P_{it} + \beta_2 SW_{it} + \beta_3 OH_{it} + \beta_4 SA_{it} + \beta_5 E_{it} + \beta_6 S_{it} + u_{it} \tag{3.3}$$

$$CR = \alpha + \beta_1 P_{it} + \beta_2 SW_{it} + \beta_3 OH_{it} + \beta_4 SA_{it} + \beta_5 E_{it} + \beta_6 S_{it} + u_{it} \quad (3.4)$$

$$IGR = \alpha + \beta_1 P_{it} + \beta_2 SW_{it} + \beta_3 OH_{it} + \beta_4 SA_{it} + \beta_5 E_{it} + \beta_6 S_{it} + u_{it} \quad (3.5)$$

$$SGR = \alpha + \beta_1 P_{it} + \beta_2 SW_{it} + \beta_3 OH_{it} + \beta_4 SA_{it} + \beta_5 E_{it} + \beta_6 S_{it} + u_{it} \quad (3.6)$$

Where:
ROA = Return on Assets of firm i at time t
ROE = Return on Equity of firm i at time t
CR = Current Ratio of firm i at time t
IGR = Internal Growth Rate of firm i at time t
SGR = Sustainable Growth Rate of firm I at time t
P = Amount of Purchases of firm i at time t
SW = Amount of Salary and Wages of firm i at time t
OH = Amount of Overhead Expenses of firm i at time t
SA= Amount of Sales Administration Expenses of firm i at time t
E = Equity Position of firm i at time t
S = Sales Turnover of firm i at time t
α = Constant term
βs = Coefficients of explanatory variables
Subscript *i* = Firms (cross-section dimensions) ranging from 1 to 75 Subscript *t* = Years (time-series dimensions) ranging from 2014 to 2019
u_{it} = Disturbance or error term of the model

3.3 Research Hypotheses

The research hypotheses that have been framed through literature review are listed below based on null approach to answer the research questions:

H_{01}: There is no significant relationship between financing the payment of purchases of raw materials by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

H_{02}: There is no significant relationship between financing the payment of salary and wages by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

H_{03}: There is no significant relationship between financing the payment of overhead expenses by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

H_{04}: There is no significant relationship between financing the payment of sales administration expenses by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

3.3 Operationalization and Measurement of Variables

The measurement models of determining the value of the variables used in the study are shown in Table 6:

Table 6: Operationalization and Measurement of the Variables of the Study

Category	Variables	Operationalization	Measurement Formula	Expected Hypothesized Direction
Dependent Variable	Financial Performance	Return on Assets (ROA)	ROA = Earnings Before Interest and Taxes (EBIT) / Total Assets	Positive or Negative
		Return on Equity (ROE)	ROE = Earnings Before Interest and Taxes (EBIT) / Total Equity	Negative or Positive
		Current Ratio (CR)	CR = Total Current Assets / Total Current Liabilities	Negative or Positive
		Internal Growth Rate (IGR)	(Retained Earnings / Net Income) X (Net Income / Equity) X (Equity / Assets)	Negative or Positive
		Sustainable Growth Rate (SGR)	Plowback Ratio X Return on Equity	Negative or Positive
Independent Variables	Financing by the Encashment of TRs through Factoring	Purchase (P)	P = Total Yearly (12 Months) Purchase Amount	Negative or Positive
		Salary and Wage (SW)	SW = Total Yearly Salary and Wage Paid SW = Total Yearly Salary and Wage Paid	Negative or Positive
		Overhead (OH)	OH = Total Yearly Overhead Costs Paid	Negative or Positive
		Sales Administration Expenses (SA)	S = Total Yearly Sales Administration Expenses Paid	Negative or Positive
Mediating Variable	Trade Receivables	Trade Receivables (TRs)	TRs = Total Trade Receivables Held at the End of the Year	Positive or Negative
Moderating Variables	Firm Characteristics	Equity Size (E)	E = Equity Position at the End of the Year	Positive or Negative
		Sales Turnover (S)	S = Yearly Sales Turnover	Positive or Negative

Source: Brealey and Myers (2000)

3.4 Data

The study has followed the approach suggested by Zikmund, Babin, Carr, Adhikari, and Griffin (2013) and thereby firstly it takes the view on total firms that had been enjoying the financing through factoring for at least five to six years in Bangladesh that have comprised the sampling frame of the study. The factoring industry is still in meager-volume in the country though it is growing increasingly in recent time. In this consideration, around 100 firms were targeted to visit to collect the required data. Finally, 75 firms were found feasible with reference to the objectives of the study. The study period is from 2014 to 2019. The data were collected from the financial statements the firms maintained. The data are cross sectional and time series in nature. The rate of missing data was expected to be zero. The number of firm-year observations stood 5400. The reason of choosing six years is that the industry has been robust recently, since 2016, after some banks have joined the industry.

3.5 Data Analysis Techniques

The study has conducted the relevant ratio analyses based on the data. The study has conducted both descriptive statistics and inferential statistics with SPSS. Excel worksheets have also been used for computing necessary calculations such as financial ratios, summary of the data, etc. The study has taken the help of multiple regression analysis to execute the models developed in the study. To establish the statistical significance of the respective hypotheses, the regression analysis is conducted at 95% confidence level.

4. Results

As shown in Table 7, the firms engaged in the businesses of manufacturing, trading, and services used this financing on average BDT 5.37 million, 5.12 million, and 12.26 million respectively for the payment of salary and wage. The overall average usage of this financing was BDT8.31 million for the same payment. The average return on assets (ROA) of the firms involved in the business of manufacturing, trading, and services stood 21.79%, 44.82%, and 39.00% respectively. The same for ROE stood 34.57%, 55.24%, and 57.59% respectively. Similarly CR stood 2.70 times, 4.88 times, and 6.05 times respectively. On the other hand IGR registered 24.23%, 50.84%, and 44.36% respectively. The SGR emerged at 39.14%, 63.46%, and -7.99% respectively.

Table 7: Financing by the Encashment TRs through Factoring and Financial Performance (As Per Nature of Business) (BDT Million**)**

NB	P	SW	OH	SA	ROA	ROE	CR	IGR	SGR
M	27.811	5.367	3.652	2.838	21.790	34.573	2.696	24.228	39.141
T	56.704	5.120	4.576	4.388	44.822	55.238	4.884	50.840	63.457
S	43.962	12.257	6.501	6.724	38.995	57.590	6.046	44.361	-7.988
Overall	43.358	8.307	5.169	4.996	36.116	50.762	4.807	40.858	25.484

Source: Study Data (2020)
Note: NB: Nature of Business, M: Manufacturing, T: Trading, S: Service

4.1 Descriptive Statistics

Table 8 shows that the sample consisted of 449 observations. Out of 75 firms, one firm started operation in November, 2014. The average payment of salary and wage stood BDT 8.31 million, with standard deviation of BDT 15.17 million indicating low variability from the actual values. The range of financing for this expense varies from minimum amount of BDT 0.00 to the maximum amount of BDT 90.25 meaning that some firms did not use this financing for the payment of salary and wage. On the other hand, some firms used this financing up to maximum BDT 90.25 million during the study period.

Table 8: Descriptive Statistics of All Variables (Overall)

Variable	Observation	Minimum	Maximum	Mean	Std. Deviation
ROA	375	0.61	629.50	36.12	46.50
ROE	375	-1111.25	1102.42	50.76	139.83
CR	449	0.05	249.00	4.81	14.64
IGR	378	0.58	683.76	40.80	54.01
SGR	378	-7779.08	1094.06	25.80	448.30
P	449	0.00	735.09	43.36	86.64
SW	449	0.00	90.25	8.31	15.17
OH	449	0.00	90.25	5.17	11.15
SA	449	0.00	90.25	5.00	9.97
CA	449	0.77	2116.21	119.01	286.84
S	449	3.07	2671.73	294.15	496.94
E	449	-83.00	1465.18	102.53	223.56

Source: Study Data (2020)

4.2 Data Diagnostic Tests

The data-diagnostic tests were conducted to ensure that the postulations of Classical Linear Regression Model (CLRM) that include tests of multicollinearity, heteroscedasticity, autocorrelation, and Hausman specification (fixed effects model or random effects model). The VIF (variance inflation factors) results of all predictors is below 10 except SA[5]. The results of heteroscedasticity test show the homoskedasticity or homogeneity in proxy (or Y value) through ROE and SGR ($p > 0.05$). The Durbin-Watson results (test for autocorrelation) show the value between 1.5 and 2.5 through ROE, CR, and SGR meaning that the data are not auto-correlated.

4.3 Test for Direct Effect

Tables 10 and 11 show the direct effect of financing P, SW, OH, and SA by the encashment of TRs through factoring. The results are presented in the proxies of ROA and ROE.

4.3.1 Effect through ROA

Table 10 presents the results of regression model 3.2 on the direct effect of the encashment of TRs through factoring on return on assets (ROA).

Table 9: Regression Results with ROA

Variable	Coefficient	Standard Error	t-Value	P
Constant	39.963302	2.872939	13.910250	0.000
P	0.007729	0.053924	0.143335	0.886
SW	-0.123427	0.201223	-0.613383	0.540
OH	-0.833218	0.552803	-1.507258	0.133
SA	0.855462	0.739112	1.157419	0.248
S	0.008584	0.006444	1.332014	0.184
E	-0.052423	0.013502	-3.882445	0.000
R Square =0.059; P = 0.001				

Source: Study Data (2020)

[5] This was unavoidable due to the data given from the respondents. Most of the firms are of SME categories. They do not maintain financials in standard format of financial statements. Sometimes, they gave data in the same amount under more than one variable. For instance, "total financing amounts of the payments of overhead expenses and sales administration expenses through factoring were given as 5% and 5% respectively of the total factoring facility availed in the year. That is, the payments of both overhead expenses and sales administration were in the same amount in a year

The results presented in Table 9 state that the financing of purchases (P) by the encashment of TRs has positive (0.007729) effect on ROA but not statistically significant (p = 0.886 > 0.05). The results also show that financing the payment of sales administration (SA) expenses by the encashment of TRs and yearly turnover measured by sales (S) have positive (0.855462, 0.008584 respectively) impact on ROA but not statistically significant (p = 0.248, 0.184 respectively and both > 0.05). On the other hand, financing the payment of salary and wages (SW), overhead (OH) expenses with the aid of the encashment of TRs through factoring has negative (-0.123427, - 0.833218 respectively) impact on ROA but not statistically significant (p = 0.540, 0.133 respectively and both > .05). Further it is noticed from the results that equity (E) position of the firms has negative (-0.052423) impact on ROA and it is statistically significant (p = .000 < 0.05). The results also show that R square (0.059) is statistically significant (p = 0.001 < 0.05).

4.3.2 Effect through ROE

Table 10 presents the results of FGLS regression model 3.3 on the direct effect of the encashment of TRs through factoring on return on equity (ROE).

Table 10: Regression Results with ROE

Variable	Coefficient	Standard Error	t-Value	P
Constant	47.536135	8.819525	5.389875	0.000
P	0.047466	0.165539	0.286734	0.774
SW	0.930672	0.617726	1.506610	0.133
OH	-1.516727	1.697030	-0.893754	0.372
SA	1.055375	2.268972	0.465134	0.642
S	0.017590	0.019783	0.889157	0.374
E	-0.093959	0.041451	-2.266755	0.024
R Square =0.019; P = 0.318				

Source: Study Data (2020)

The results show that financing the payment for purchases (P) with the help of the encashment of TRs by factoring has positive (0.047466) effect on the performance of firms expressed in return on equity (E) but it is not statistically significant (p = 0.774 > 0.05). Similarly, financing the payment of the expenses like salary and wages (SW), sales administration (SA) by the encashment of TRs through factoring has positive (0.930672, 1.055375 respectively) impact on ROE but it is not statistically significant (p = 0.133, 0.642 respectively and both > 0.05). On the other hand, financing the payment of overhead (OH) expenses by the encashment of TRs through factoring and the equity position of the firms have negative (-1.516727, - 0.093959 respectively) impact on ROE. This negative impact is not statistically significant under OH (p = .372> 0.05) but under E it is statistically significant (p = 0.024 < 0.05). The results also show that R square (0.019) is not statistically significant (p = 0.318 > 0.05).

4.3.2 Effect through CR

Table 11 presents the results of FGLS regression model 3.4 on the direct effect of the encashment of trade receivables through factoring on current ratio (CR).

Table 11: Regression Results with CR

Variable	Coefficient	Standard Error	t-Value	P
Constant	5.449704	0.796506	6.842009	0.000
P	-0.046710	0.016189	-2.885273	0.004
SW	-0.151545	0.060040	-2.524047	0.012
OH	0.708794	0.165358	4.286433	0.000
SA	-0.049366	0.222455	-0.221916	0.824
S	-0.002392	0.001908	-1.253863	0.211
E	-0.000704	0.003929	-0.179268	0.858
R Square = 0.108; P = 0.000				

Source: Study Data (2020)

The results presented in the table reveal that financing the payment for purchases (P), payment for the expenses of salary and wages (SW), and sales administration (SA) by the encashment of trade receivables with factoring has negative (-0.046710, -0.151545, -0.049366 respectively) impact on the position of current ratio (CR) of the firms. This negative impact under P and SW is statistically significant ($p = 0.004$, 0.012 respectively and both < 0.05) and under SA it is not statistically significant ($p = 0.824 > 0.05$). On the other hand, financing the payment of overhead (OH) expenses with the help of the encashment of trade receivables though factoring has positive (0.708794) impact on CR and it is statistically significant ($p = 0.000 < 0.05$). The position of firms in terms of sales (S) and equity (E) has also negative (-0.002392, -0.000704 respectively) impact on their level of CR and it is not statistically significant ($p = 0.211$, 0.858 respectively and both > 0.05). The results also show that R square (0.108) is statistically significant ($p = 0.000 < 0.05$).

4.3.4 Effect through IGR

Table 12 presents the results of FGLS regression model 3.5 on the direct effect of the encashment of trade receivables through factoring on internal growth rate (IGR).

Table 12: Regression Results with IGR

Variable	Coefficient	Standard Error	t-Value	P
Constant	44.826116	3.320108	13.501404	0.000
P	0.001590	0.062656	0.025376	0.980
SW	-0.193631	0.233782	-0.828254	0.408
OH	-1.027601	0.642333	-1.599794	0.110
SA	1.165113	0.858802	1.356672	0.176
S	0.011812	0.007485	1.578219	0.115
E	-0.060555	0.015689	-3.859714	0.000
R Square = 0.058; P = 0.001				

Source: Study Data (2020)

The results in the table show that financing the payment for purchases (P) by the encashment of trade receivables with factoring has positive (0.001590) impact on the internal growth rate (IGR) of the firms but it is not statistically significant ($p = 0.980 > 0.05$). Similarly, financing the payment of the expenses of sales administration (SA) by the encashment of the trade receivables through factoring has the positive (1.165113) impact on IGR but it is not statistically significant ($p = 0.176 > 0.05$). On the other hand, financing the payment of salary and wages (SW), overhead (OH) expenses by the encashment of trade receivables with factoring has negative (-0.193631 and - 1.027601 respectively) impact on IGR but it is not statistically significant ($p = 0.408$, 0.110 respectively and both > 0.05). The position of firms in terms of sales (S) and equity (E) has positive (0.011812) and negative (-0.060555) (respectively) impact on the performance of the firms measured in IGR and it is not statistically significant under S ($p = 0.115 > 0.05$) but under E, it is statistically significant ($p = 0.000 < 0.05$). The results also show that R square (0.058) is statistically significant ($p = 0.001 < 0.05$).

4.3.3 Effect through SGR

Table 13 presents the results of FGLS regression model 3.6 on the direct effect of the encashment of trade receivables through factoring on sustainable growth rate (SGR).

Table 13: Regression Results with SGR

Variable	Coefficient	Standard Error	t-Value	P
Constant	6.448192	28.303128	0.227826	0.820
P	-0.078372	0.534123	-0.146730	0.883
SW	2.173651	1.992933	1.090679	0.276
OH	-1.915460	5.475739	-0.349808	0.727
SA	2.143813	7.321085	0.292827	0.770
S	0.034522	0.063805	0.541051	0.589
E	-0.077616	0.133745	-0.580330	0.562
R Square = 0.006; P = 0.895				

Source: Study Data (2020)

The results in the table state that financing the payment of purchases (P) and overhead (OH) expenses by the encashment of trade receivables with the help of factoring has negative (- 0.078372, -1.915460 respectively) impact on the sustainability of the firms measured in sustainable growth rate (SGR) and this negative impact is not statistically significant (p = 0.883, 0.727 respectively and both > 0.05). On the other hand, financing the payment of salary and wages (SW) and sales administration (SA) expenses by the encashment of trade receivables with the aid of factoring has positive impact (2.173651, 2.143813 respectively) on SGR but it is not statistically significant (p = 0.276, 0.770 respectively and both > .05). The position of firms in terms of their sales (S) and equity (E) has positive (0.034522) and negative (-0.077616) impact respectively and both are not statistically significant (p = 0.589, 0.562 respectively and both > 0.05).

5. Discussion of Findings

This section provides the interpretation of the empirical results found in the study. The interpretations are in relation to the ground making theories and previous empirical studies on financing through factoring and financial performance of the firms. The interpretations are organized as per the specific objectives of the study and focus on the major findings of the study. The interpretations are presented in the subsequent sections.

5.1 Impact of Financing through Factoring on Financial Performance

The study finds the impact of financing through factoring on the financial performance (and/or long-term financial growth) of the firms that have been using the same financing for a long time, particularly from 2014 to 2019. The components which are generally financed under this modality (factoring) have been categorized

into four major headings such as purchase (P), salary and wages (SW), overhead (OH) expenses, and sales administration (SA) expenses have been used as the explanatory variables (Ross et al., 2003). On the other hand, return on assets (ROA), return on equity (ROE), current ratio (CR), internal growth rate (IGR), and sustainable growth rate (SGR) have been included as the proxies of measuring financial growth of the firms (Ayako et al., 2015; O'Gorman, 2001; Smallborne et al., 1995; Hart & Milstein, 2004; Delai & Takahashi, 2011; Drever & Hutchinson, 2007; Mian & Clifford, 1992; Ngugi et al., 2017; Saulnier & Jacoby, 1943). The discussion of this section is based on the regression results presented in Tables 9, 10, 11, 12, and 13.

5.1.1 Effect of Financing the Payment of Purchases (P)

Firstly, the study seeks to find the effect of financing the purchases (P) of raw materials by the encashment of TRs through factoring on the financial growth of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

The regression results presented in Tables 9, 10, 11, 12, and 13 reveal that the effect of financing the payment of purchases (P) is positive on the financial growth under the proxies of ROA, ROE, IGR but it is not statistically significant. However the impact is negative under the proxies of CR and SGR and it is statistically significant under CR but insignificant under SGR.

The results under ROA, ROE, IGR, and SGR support hypothesis 1 which states that there is no significant relationship between financing purchases (P) by the encashment of trade receivables through factoring and the long-term financial growth of the firms that are involved in manufacturing and/or providing goods and services and selling the same on credit.

The positive results reveal that the more financing of the purchases (P) by the encashment of trade receivables through factoring, the more growth of the firms in terms of ROA, ROE, and IGR. It is consistent with the findings of Sindani (2018); Paul et al. (2018); Nunes and Serrasquiro (2015); Nunes et al. (2012).

This positive effect can be explained with the help of the theories of: (i) liquidity preference theory developed by John Maynard of Keynes (Stephenson, 1950; Jhingan, 2004); and (ii) pecking order theory developed by G. Donaldson, S. C. Myers, and N.S. Majluf (Bhama et al., 2015). According to the liquidity preference theory, the main reason of the encashment of trade receivables is to meet buying-needs of the firms. The pecking order theory postulates that the firms use their invoices as an internal source of fund for liquidity purpose (Bhama et al., 2015; Ghosh, 2016).

The negative finding is contradictory with hypothesis 1 under CR which is also statistically significant that supports this significant findings (relationship) of Dekesi and Ozogbuda (2019). Dekesi and Ozogbuda (2019) found that maintaining high level of trade receivables brings lower current ratio (CR). The study also finds that paying purchases (P) in cash with liquidating trade receivables brings down the

liquidity position. The study also finds similarity with Kozarević and Hodžić (2016) as well as Beck et al., (2006) that found positive result to solve liquidity crisis of firms. But this resulted into lowering liquidity level of the firms.
The sustainable growth rate (SGR) is the highest growth rate a firm can maintain without increasing its financial leverage (Brealey & Myers, 2000; Mian & Clifford, 1992). The negative impact under SGR reveals that more use of financing the payment of purchases (P) by the encashment of trade receivables brings down the debt-free growth of the firm. It means that one unit of financing of purchases (P) by the encashment of trade receivables diminishes sustainable growth capacity by 0.078372.

5.1.2 Effect of Financing the Payment of Salary and Wages (SW)

Secondly, the study seeks to ascertain the effect of financing the payment of salary and wages (SW) by the encashment of trade receivables with the help of factoring on the financial growth of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.
The regression results presented in Tables 9, 10, 11, 12, and 13 reveal that the effect of financing the payment of salary and wages (SW) is positive under the proxies of ROE and SGR but it is not statistically significant. However the impact is negative under the proxies of ROA, CR, and IGR and it is statistically significant under CR but insignificant under ROA and IGR.
The results under the proxies of ROA, ROE, IGR, and SGR support hypothesis 2 which states that there is no significant relationship between financing the payment of salary and wages (SW) by the encashment of trade receivables through factoring and the long-term financial growth of the firms that are involved in manufacturing and/or providing goods and services and selling the same on credit.
The positive results reveal that the more the financing of the payment of salary and wages (SW) by the encashment of trade receivables through factoring, the more the growth of firms in ROE and SGR. The positive rates of intercept of ROE and SGR are 0.930672 and 2.173651 respectively.
The sustainable growth of a firm depends on the plowback rate and the return on equity (Brealey et al., 2012). So, as ROE is positively influenced by this financing, similarly SGR is also harnessed positively. This finding is consistent with the interest of Darabos and Martha (2017) who sought further study in finding the long-term growth of firms with the help of factoring in Hungary. The positive coefficient is also supportive by the results of Fiordelisi (2011) who found positive impact on the growth of the firms in two ways: direct benefits (such as betterment of employees, borrowers, investors, etc.); and (ii) induced benefits (such as betterment of the families through consumption and savings, tax revenue for the government, increasing deposits of the firms and investing the same, etc.).
This positive effect can be explained with the help of M-M theory. This theory proposes to use that fund that may sharpen further the edge of earning power of a firm disregarding the proportion of equity and debt in the capital structure (Koh,

Ang, Brigham, & Ehrhardt, 2014). In support of this theory, Sule, Amuni, Obasan, Banjo, & Hassan (2015) mention that swift, regular, and in-time payment of salary and wages (SW) influences the continuous survival of a firm which is enhanced by the encashment of trade receivables. Quick payment of compensation is a positive image of a firm towards an employee or a worker (Muo, 2007; Mian & Clifford, 1992).

The negative finding is contradictory with hypothesis 2 under CR which is also statistically significant and it is contradictory to the findings of Dekesi and Ozogbuda (2019). Dekesi and Ozogbuda (2019) found that maintaining high level of trade receivables brings lower current ratio (CR). It means that if the firms could have liquidated the trade receivables, they would not suffer from liquidity crisis. In the study, the firms take cash with the help of factoring and use the same for immediate payments such as payments for purchases (P), salary and wages (SW) and consequently they (firms) lack cash.

The negative results under ROA and IGR are supportive to the findings of Salaberrios (2016) who found that high profit making companies can afford factoring cost. Martines-Sola, Gracia-Teruel, and Martinez-Solano (2013) also found that liquidity position always does not enhance the value of a firm. They stated that liquidity after a certain level, rather, declines the value of the firm.

5.1.3 Effect of Financing the Payment of Overhead (OH) Expenses

Thirdly, the study aims to find out the effect of financing the payment of overhead (OH) expenses by the encashment of trade receivables through factoring on the financial growth of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

The regression results presented in Tables 9, 10, 11, 12, and 13 reveal that the effect of financing the payment of overhead (OH) expenses is positive under the proxy of CR and it is statistically significant. However the impact is negative under the proxies of ROA, ROE, IGR, and SGR and it is not statistically significant.

The results under ROA, ROE, IGR, and SGR support hypothesis 3 which states that there is no significant relationship between financing the payment of overhead (OH) expenses by the encashment of trade receivables through factoring and the long-term financial growth of the firms that are involved in manufacturing and/or providing goods and services and selling the same on credit.

However, the positive results under CR reject the hypothesis 3. The result is statistically significant. The positive results reveal that the more financing the payment of overhead (OH) expenses by the encashment of trade receivables through factoring, the more growth of the firms measured in current ratio (CR). It is consistent with the findings of Klapper (2000, 2005, 2006), Greater London Enterprise Ltd. (2003) and Mian & Clifford (1992). These studies state that the use of financial technology, factoring, enhances the liquidity position of firms. Czternasty & Mikolajczak (2014) state that factoring finance does not impact inversely debt-ratio of a firm since it is an off-balance sheet source of finance.

Shuzhen, Liang, and Zheng (2014) found factoring as a hybrid solution for firms in China to address liquidity crisis.

This positive effect on CR can be explained with the help of the trade-off theory. The firms may use the financing by the encashment of trade receivables to pay overhead (OH) expenses as much as possible to get positive financial benefit. But, as per the trade-off theory, the firms should use this financing until the marginal cost of financing is equal to the marginal benefit of financing.

The negative results indicate that more use of financing by the encashment of trade receivables through factoring to pay the overhead (OH) expenses decreases the growth of firms in terms of return on assets (ROA), return on equity (ROE), internal growth rate (IGR), and sustainable growth rate (SGR). The negative results are supportive to the findings of Hartmann-Wendels and Stöter (2010) who found also negative relationship between the use of factoring finance and the growth of the firms. They found that higher the amount of net income and equity position of firms, the lower the dependency on the encashment of trade receivables. The negative findings are also similar to those of Salaberrios (2016) who suggested factoring for those firms that are highly profitable to ensure financial growth. Because, Salaberrios (2016) found factoring as an expensive option of finance.

5.1.4 Effect of Financing the Payment of Sales Administration (SA) Expenses

Fourthly, the study intends to find out the effect of financing the payment of sales administration (SA) expenses by the encashment of trade receivables through factoring on the long-term financial growth of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.

The regression results presented in Tables 9, 10, 11, 12, and 13 reveal that the effect of financing the payment of sales administration (SA) expenses is positive under the proxies of ROA, ROE, IGR, and SGR and but it is not statistically significant. However the impact is negative under the proxy of CR and is not statistically significant.

The results under ROA, ROE, IGR, and SGR support hypothesis 4 which states that there is no significant relationship between financing the payment of sales administration (SA) expenses by the encashment of trade receivables through factoring and the long-term financial growth of the firms that are involved in manufacturing and/or providing goods and services and selling the same on credit.

The positive findings show that financing the payment of sales administration (SA) expenses by the encashment of trade receivables through factoring increases growth of firms in ROA, ROE, IGR, and SGR. It is consistent with the findings of Dekesi and Ozogbuda (2019), Sindani (2018), Salaberrios (2016), Milenkovic-Kerkovic and Dencic-Mihajlov (2012). They found that quick payment of the expenses like sales promotion, advertisements, insurance, shipping costs, loading- unloading costs, etc. induces profitability of firms. The encashment of trade receivables helps in quick payments. Borgia et al. (2010) found that factoring contributes positively to the development of firms including overall GDP-indicators of a country.

This positive effect can be explained with the help of the theories of: (i) liquidity preference theory developed by John Maynard of Keynes (Stephenson, 1950; Jhingan, 2004); (ii) pecking order theory developed by G. Donaldson, S. C. Myers, and N.S. Majluf (Bhama, Jain & Yadav, 2015), and (iii) M-M theory developed by Franco Modigliani and Marton H. Miller (Koh, Ang, Brigham, & Ehrhardt, 2014). According to these theories, firms address their sales-supporting expenses in time with liquidating invoices to ensure their financial growth.

The negative results indicate that more use of financing by the encashment of trade receivables through factoring to pay sales administration (SA) expenses decreases the growth of firms in terms of current ratio (CR). The negative results are supportive to the findings of Salaberrios (2016) who recommended factoring for high profit making companies. Similarly, Martines-Sola, Gracia- Teruel, & Martines-Solano (2013) found that factoring rather brings negative value to the firm after a certain level of cash position.

5.2 Summary of Hypotheses Tests

Table 14 provides the results of the tests of hypotheses. It provides the decisions (reject or fail to reject) null [H_0] hypotheses categorically.

Table 14: Results of Hypotheses Tests

Hypotheses	Statement Hypothesis	Reject H_0 / Fail to Reject H_0
H_{01}	There is *no* significant relationship between financing the payment of purchases of raw materials by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.	Fail to reject H_{01} (P: ROA) Fail to reject H_{01} (P: ROE) Reject H_{01} (P: CR) Fail to reject H_{01} (P: IGR) Fail to reject H_{01} (P: SGR)
H_{02}	There is *no* significant relationship between financing the payment of salary and wages by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.	Fail to reject H_{02} (SW: ROA) Fail to reject H_{02} (SW: ROE) Reject H_{02} (SW: CR) Fail to reject H_{02} (SW: IGR) Fail to reject H_{02} (SW: SGR)
H_{03}	H_{03}: There is *no* significant relationship between financing the payment of overhead expenses by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.	Fail to reject H_{03} (OH: ROA) Fail to reject H_{03} (OH: ROE) Reject H_{03} (OH: CR) Fail to reject H_{03} (OH: IGR) Fail to reject H_{03} (OH: SGR)
H_{04}	There is no significant relationship between financing the payment of sales administration expenses by the encashment of TRs through factoring and financial performance of the firms involved in manufacturing and/or providing goods, services and selling the same on credit.	Fail to reject H_{04} (SA:ROA) Fail to reject H_{04} (SA:ROE) Fail to reject H_{04} (SA: CR) Fail to reject H_{04} (SA: IGR) Fail to reject H_{04} (SA: SGR)

6. Implications of the Study

6.1 Theoretical Implications

The exceptional novelty of this study is the application of Black-Scholes Options Pricing model. This model has been analogized and extended to a non-traditional financing model: financing through factoring. The study has measured the reflections of Black-Scholes model (BSM) through the application of factoring. has been a The Black-Scholes model has been applied to TRs to measure its (TRs') mediating role in financing the operating expenses of the firms. The financing by factoring is varied in terms of amount, interest rate depending on the quality of invoices which are controlled by the creditworthiness of debtors, credit period or payment period, nature of goods or services supplied, etc. This also happens in financing through derivative contract defined by BSM. This contract is influenced by the underlined assets as explained by BSM. In this way, this study has brought two types of variations in financing in factoring and option contracts. These two variations are due to the variations in TRs (for factoring) and underlined assets (for option contracts) respectively.

The study has further exceptional contribution to the theoretical perspective. Firstly, the study synthesizes the impact to measure more specifically the contribution of financing through factoring. The quantitative measures include ROA, ROE, CR, IGR, and SGR. Thirdly, the use of proxies IGR and SGR are scarce. The study has included these proxies with the traditional proxies of ROA, ROE, and CR. Thirdly, the empirical study is scarce in the industry. The study endeavors to contribute to the industry providing a real-life findings of the firms using this financing for a long-time. Fourthly, it gives a measure for the emerging fintech industry, because most of the firms have taken this financing with the help of fintech companies such as bKash, Nagad, balance transfer, etc. It gives a direction towards the digital financing, AI dominated financing and thereby the reflection of BSM in AI driven factoring.

6.2 Practical Implications

The study has also implications for practitioners and policy makers. Firstly, the study shows that financing the payment of purchases through factoring has a positive effect on return on assets, return on equity. Corporate managers, owners of the businesses (since a significant number of the firms studied are of sole proprietorship) may give more attention to heighten the use of factoring to fund the payment of purchases of the business essentials like raw materials, business inputs, resources that are necessary to produce finished goods and services to maximize sales. The reflection of the growth of a firm commonly is reflected through return on assets, return on equity, and current ratio besides two non-traditional proxies: internal growth rate and sustainable growth rate.

Secondly, the study finds that financing the payment of salary and wages through factoring has a positive effect on return on equity. Human resources are the key input for driving a firm. They play a strategic role in inculcating the growth of a

firm. Their payments for compensation, bonus, benefits, overtime, training and development, safety, performance rewards, etc. can be enhanced through factoring modality of financing. The motivation of human beings in the organization influences its (organization's) prosperity (West III & Bernhardt, 2009). On the other hand, such payment through factoring has negative impact on return on assets. It represents that more cash outflows through this mode brings a negative impact on the use of the assets of the firm. It also diminishes the liquidity position of the firm. Similarly, the equity position, retained earnings, amount of net income are adversely impacted. So, the business managers, owners should cautiously use the fund from this source: the conversion of TRs into liquidity.

Thirdly, the study finds that financing the payment of overhead expenses through factoring has negative effect on the basic outlook of the growth of the firms: on return on assets and return on equity. So, managers and the business owners may be reluctant to use factoring in respect of the growth of return on assets and return on equity.

Fourthly, the study finds positive effect on return on assets and return on equity for financing the payment of sales administration expenses through factoring. The components of such expenses are related to sales support activities such as discharging purchase orders, compilation of sales reporting, preparing sales materials, sample processing, managing retail sales activities, insurance expenses, etc. These are directly related to the utilization of assets, equity, internal financial resources (retained earnings), business expansion, etc. So, managers and business owners may concentrate on paying such expenses through factoring to get positive results on return on assets and return on equity.

The cash outflow for paying such activities reduces the liquidity position of the firms. The managers and business owners may select the preference between the growths in return on assets, return on equity and the liquidity growth, in other side. As per the preference, they can manage the payment of sales administration expenses through factoring.

7. Conclusion

The study has examined the relevance of Black-Scholes model (BSM) with financing through factoring. It has explained this relevance with the financial performance of the firms that use this financing. In other words, the study has assessed through the lanes of BSM how the financial growth responds to the financing through factoring. To measure this response, the study has used five proxies: (i) return on assets (ROA), (ii) return on equity (ROE), (iii) current ratio (CR), (iv) internal growth rate (IGR), and (iv) sustainable growth rate (SGR). Four explanatory variables have been used in this study named as financing the payments of purchases (P), salary and wages (SW), overhead (OH) expenses, and sales administration (SA) expenses.

The findings of the study have supported the hypotheses. The study has found significant relation between financing the payments of purchases (P), salary and

wages (SW), overhead (OH) expenses, sales administration (SA) expenses through factoring and financial growth of the firms. The financial growth expressed through current ratio (CR) shows significant relation. The other proxies ROA, ROE, IGR, and SGR don't significant relation. Since CR is one of the proxies, it can be claimed that factoring has significant impact on the financial growth of the firms. And since the study has explored BSM with factoring, the analysis also finds a significant impact of BSM on the financial growth of the firms that use financing through factoring.

The results of the study are subject to some limitations. This study is limited to non-financial firms. The number of firms using this financing is still limited. Finally, 75 firms were found feasible meeting the objective of the study. The firms vary abruptly in the magnitude of sales turnover, profit margin, use of financing through factoring, etc.

Most of the responding firms are unorganized in maintaining their financials. Sometimes, they provided the figures in percentage forms, such as "total financing amount of the payment of annual salary and wages through factoring 60 percent of the total factoring facility availed in the year". This type of information has led some unavoidable difficulties for analysis, such as exceeding VIF tolerance level 10.00 in one variable in testing the multicollinearity of the data.

Future research may consider these limitations. In the market, the penetration of factoring is increasing. It is expected that the number of the firms using factoring will rise in the coming years. Further research may be conducted covering firms varied widely in nature of business, size of business, legal entity of business, geographical concentration, nature of industry and/or business, etc.

References

[1] Author's Visit to the Factors. (2020).

[2] Ayako, A., Githui, T., & Kungu. G. (2015). Determinants of the Financial Performance of Firms Listed at the Nairobi Securities Exchange. Perspectives of Innovations, Economics & Business, 15(2), 84 – 94.

[3] Banos-Caballero, S., Gracia-Teruel P. J. & Martines-Solano, P. (2012). How Does Working Capital Management Affect the Profitability of Spanish SMEs? Small Business Economics, 39(2), 517 – 529.

[4] Beck, T., Demirguc – Kunt, A., Laeven, L., & Maksimovic, V. (2006). The Determinants of Financing Obstacles. Journal of International Money and Finance 25, 932 – 952.

[5] Benea, I. & Duma, F. (2013). Financing with Receivable: Factoring, Securitization and Collateral. Finance: Challenges of the Future, 15(15), 79 – 86.

[6] Bhama, Bhandana; Jain, Pramod Kumar & Yadav, Surendra Singh. (2015). Testing the Pecking Order Theory of Deficit and Surplus Firms: Indian Evidence. International Journal of Managerial Finance, Volume 12 No. 3, pp.

335 -350. Emarald Group Publishing Limited. 1743-9132 DOI 10.1108/IJMF-06-2014-0095.

[7] Bhattacharya, Hrishikes. (2010). Working Capital Management: Strategies and Techniques, Second Edition. PHI Learning Private Limited, New Delhi – 110001.

[8] Black, F. and Scholes, M. (1973). The Pricing of Options and Corporate Liabilities. Journal of Political Economy, Vol. 81, No. 3, pp.637–659.

[9] Borgia, Daniel J.; Swaleheen, Mushfiq; Jones, Travis L.; Weeks, H. Shelton. (2010). Accounts Receivable Factoring As A Response To Weak Governance: Panel Data Evidence. International Business and Economics Research Journal, Volume 9, Number 2, February 2010.

[10] Brealey, Richard & Stewart C. Myers. (1991). Principles of Corporate Finance. New York: McGraw-Hill.

[11] Brealey, Richard A. & Myers, Stewart C. (2000). Principles of Corporate Finance. (6th edn). Boston: McGraw Hill.

[12] Brealey, R. A., Myers, S. C., & Marcus, A. J. (2012). Fundamentals of Corporate Finance. New York: McGraw-Hill.

[13] Carson, D. J., Cromie, S., McGowan, P. and Hill, J. (1995). Marketing and Entrepreneurship in SMEs: An Innovative Approach, Prentice Hall, London.

[14] Cela, S., Shkurti, R., & Hilaj, B. (2013). Factoring as the Short-Term Finance for SME and Possibility of its Application in Albania. International Journal of Economic Perspectives, 7 (3), 109 – 117.

[15] Darabos, Eva & Martha, Berndett Beresne. (2017). Trends of Factoring Turnover in International Comparisons. SEA – Practical Application of Science, Volume V, Issue No. 13 (1/2017).

[16] Davis, Andy & Chen, Peter. (2014). Receivables Finance in Emerging Markets: How Financial Innovation can Enhance Social and Economic Development. Advance Global Capital.

[17] Dekesi, A.C. & Ozogbuda, S.C. (2019). Trade Receivables Management and Liquidity of Oil Service Companies (Case in Rivers State, Nigeria). International Journal of Economics & Business ISSN: 2717-3151, Volume 2, Issue 2, page 191 – 217.

[18] Delai, Ivete & Se´rgio Takahashi. (2011). Sustainability Measurement System: A Reference Model Proposal. Social Responsibility Journal. Vol. 7 No. 3, p. 438.

[19] Deloof, M. (2003). Does Working Capital Management Affects Profitability of Belgian Firms? Journal of Business Finance & Accounting, 30(3), 573 – 587.

[20] Drever, M. & Hutchinson, P. (2007). Industry Differences in the Determinants of the Liquidity of the Australian Small and Medium Sized Enterprises. Small Enterprise Research, 15(1), 60 – 76.

[21] Emery, Gary W. (1988). Positive Theories of Trade Credit. In Y. H. Kim and V Srinivasan (eds.). Advances in Working Capital Management, Vol. 1 (London: JAI Press Inc.).

[22] FCI (Factors Chain International). (2020). Factoring Turnover by Country in 2019. https://fci.nl/ [Accessed 8 June 2020].
[23] FCI. (2017). Annual Review, 2017. Factors Chain International. FCI Head Office Keizersgracht 559, 1017 DR Amsterdam, The Netherlands. Available at www.fci.nl [Accessed 30 May 2019]
[24] FCI. (2018). Annual Review, 2018. Factors Chain International. FCI Head Office Keizersgracht 559, 1017 DR Amsterdam, The Netherlands. Available at www.fci.nl [Accessed 30 May 2019]
[25] FCI. (2019). Annual Review, 2019. Factors Chain International. FCI Head Office Keizersgracht 559, 1017 DR Amsterdam, The Netherlands. Available at www.fci.nl [Accessed 30 May 2019]
[26] FCI. (2020). Annual Review, 2020. Factors Chain International. FCI Head Office Keizersgracht 559, 1017 DR Amsterdam, The Netherlands. Available at www.fci.nl [Accessed 30 May 2019]
[27] Fiordelisi, Franco (Ed.). (2011). The Impact of Factoring on the Economy: Evidences from Italy, France and UK. Discussion Paper Series n. 1/2011. Università degli Studi di Roma Tre (Italy).
[28] Ghosh, P. (2016). Analysis of Profitability and Risk: A Case Study of mrf Ltd. International Journal of Research in Commerce & Management, 7, 74 – 77.
[29] Govindarajan, Vijay. (2011). Five Steps to Long-Term Growth. Harvard Business Review, September, 2011.
[30] Hart, S.L. & Milstein, M.B. (2004). ‘‘Criando Valor Sustenta´ Vel’’, RAE Executivo, Vol. 3 No. 2, pp. 65-79 (in Portuguese).
[31] Hartmann-Wendels, Thomas & Stöter, Alwin. (2010). Accounts Receivable Management and the Factoring Option: Evidence from a Bank-Based Economy. JEL classification: G32, http://ssrn.com/abstract=2140870
[32] Hodgetts, R. M. & Kuratko, D.R. (1995). Effective Small Business Management, Vol. 5E, The Dryden Press, Fort Worth, TX.
[33] Holmlund, M. & Kock, S. (1998). Relationships and the Internationalization of Finish Small and Medium-Sized Companies. International Small Business Journal, Vol. 16 No. 64, pp. 46-63.
[34] Hoti, Ulpian. (2014). Factoring: A Financial Instrument. Interdisplinary Journal of Research and Development, Vol (I), No.2 “Alexander Moisiu University, Durrës, Albania.
[35] IDLC. (2018). Supply Chain Finance: Can It Flourish in Bangladesh by Adopting Global Best Practices? IDLC Monthly Business Review, Vol. 14, No. 11, pp. 6 – 14.
[36] Ivanovic, S., Baresa, S, & Bogdan, S. (2011). Alternative Model of Financing. UTMS Journal of Economics (2): 189 – 206.
[37] Jhingan, M. L. (2004). Macroeconomic Theory (11th ed.). Vrinda Publications.
[38] Kirkby, D. (1976). Finance through Factoring. Managerial Finance. Vol. 2 No. 3, pp. 211 – 228. Emerald.
[39] Klapper, Leora. (2000). Determinants of Global Factoring. The World Bank.

[40] Klapper, Leora. (2005). The Role of Factoring for Financing Small and Medium Enterprises. Policy Research Working Paper, The World Bank.
[41] Klapper, L. (2006). The Role of Factoring for Financing Small and Medium Enterprises. Journal of Banking & Finance, 30, pp. 3111 – 3130.
[42] Klapper, Leora. (2005). The Role of Factoring for Financing Small and Medium Enterprises. Policy Research Working Paper, The World Bank.
[43] Koh, Annie; Ang, Ser-Keng; Brigham, Eugene F.; Ehrhardt, Michael C. (2014). Financial Management, Theory and Practice. Cengage Learning Asia Pte Ltd., Singapore.
[44] Market Pulse, Monthly Financial Magazine, Issue 147, April 2019
[45] Makori, Daniel Mogaka & Jagongo, Ambrose. (2013). Working Capital Management and Firm Profitability: Empirical Evidence from Manufacturing and Construction Firms Listed on Nairobi Securities Exchange, Kenya. International Journal of Accounting and Taxation, Vol. 1 No. 1, December 2013.
[46] Martines-Sola, Cristina & Gracia-Teruel, Pedro J. & Martinez-Solano, Pedro. (2013). Corporate Cash Holding and Firm Value. Applied Economics, 45:2, 161 170, DOI: 10.1080/00036846.2011.595696
[47] Mbula, Kilonzo Jennifer; Memba, S.F.; Njeru A. (2016). Effect of Accounts Receivable on Financial Performance of Firms Funded By Government Venture Capital in Kenya. IOSR Journal of Economics and Finance, Volume 7, Issue 1. Ver. I (Jan. -Feb. 2016), PP 62-69
[48] Mian, Shehzad L. & Smith Jr., Clifford W. (1992). Accounts Receivable Management Policy: Theory and Evidence. Journal of Finance, Vol. XLVII. No. 1, March 1992.
[49] Milenkovic-Kerkovic, Tamara & Dencic-Mihajlov, Ksenija. (2012). Factoring in the Changing Environment: Legal and Financial Aspects. Elsevier, Procedia - Social and Behavioral Sciences 44 (2012) 428 – 435
[50] Muo, Ik. (2007). Motivation in Complex Organisations. In Bello-Imam et al. (eds.), Fundamentals of Human Resources Management in Nigeria, College Press & Publishers, Ibadan.
[51] Ngugi, Simon K.; Gakure, Roselyn W.; Gekara, Geoffrey Mouni; & Kahiri, Dr. James K. (2017). Influence of Policies on Accounts Receivables Management in the Hotel Industry in Kenya. American Journal of Accounting, Vol.1, Issue 1 No.5, pp. 93-115, 2017.
[52] Nunes, P. & Serrasquiro, Z. (2015). Profitablity Determinants of Portuguese Knowledge-Intensive Business Services: Empirical Evidence Using Panel Data Models. Applied Economics Letters, 22(1), 51 – 56.
[53] Nunes, P., Viveiros, A., & Serrasqueiro, Z. (2012). Are the Determinants of Young SME Profitability Different? Empirical Evidence Using Dynamic Estimators. Journal of Economics and Management, 13(3), 443 – 470.
[54] O'Gorman, C. (2001). The Sustainability of Growth in Small and Medium-Sized Enterprises. International Journal of Entrepreneurial Behaviour & Research, Vol. 7 No. 2, pp. 60-75.

[55] Paul, Salima Y., Guermat, Cherif , & Devi, Susela. (2018). Why Do Firms Invest in Accounts Receivable? An Empirical Investigation of the Malaysian Manufacturing Sector. Journal of Accounting in Emerging Economies, Vol. 8 No. 2, pp. 166 – 184.
[56] Perman, P. (1984). "Factoring – "Passport to Financial Freedom". Industrial Management & Data Systems. Vol. 84 No. 1/2, pp. 26 – 28. https://doi.org/10.1108/eb057350 [Accessed 17 November 2019]
[57] Qi-Chang, Wang & Yuan, Lou. (2016). Receivables Financing: One Way to Settle Financing Difficulty of Middle-small Businesses. Collected Essays on Finance and Economics. School of Finance, Zhejiang University of Finance and Economics, Hangzhou 310018, China.
[58] Ropega, J. (2011). The Reasons and Symptoms of Failure in SME. International Advances in Economic Research, 17 (4), 476 – 483.
[59] Ross, Stephen, A.; Westerfield, Randolf W.; & Jordan, Bradford, D. (2003). Fundamentals of Corporate Finance. (6th edn). McGraw-Hill/Irwin.
[60] Salaberrios, Ivan Justin. (2016). The Effects of Using Invoice Factoring to Fund a Small Business. Doctoral Thesis. College of Management and Technology, Walden University.
[61] Saulnier, Raymond J. & Jacoby, Neil, H. (1943). The Development of Accounts Receivable Financing. Accounts Receivable Financing. pp 15 – 31.
[62] Sindani, Mary Nelima Lyani. (2018). Effects of Accounts Receivable Financing Practices on Growth of SMEs in Kakamega County, Kenya. Expert Journal of Finance, Volume 6, pp.1-11, 2018.
[63] Smallborne, D., Leigh, R. & North, D. (1995). The Characteristics and Strategies of High Growth SMEs. International Journal of Entrepreneurial Behaviour & Research, Vol. 1 No. 3, pp. 44-62.
[64] Soufani, K. (2002). The Decision to Finance Accounts Receivables: The Factoring Option. Managerial and Decision Economics, 23: 21-32. John Wiley & Sons. Ltd.
[65] Soufani, K. (2002). Factoring and UK Small Business. Journal of Small Business and Entrepreneurship, 3 (15), 78 – 89.
[66] Soufani, K. (2001). The Role of Factoring in Financing UK SMEs: A Supply Side Analysis. Journal of Small Business and Enterprise Development. Vol. 8 No. 1, pp. 37-46.
[67] Soufani, K. (2001). The Role of Factoring in Financing UK SMEs: A Supply Side Analysis. Journal of Small Business and Enterprise Development. Vol. 8 No. 1, pp. 37-46.
[68] Srivastava, A., & Shastri, M. (2018). A Study of Black–Scholes Model's Applicability in Indian Capital Markets. Paradigm, 24(1), 73-92. https://doi.org/10.1177/0971890720914102
[69] Stephenson, J. (1950). Principles and Practice of Commerce. Pitman.
[70] Sule, O. E., Amuni, S. I., Obasan, K. A., Banjo, Hassan A. (2015). Wages and Salaries as a Motivational Tool for Enhancing Organizational Performance. A Survey of Selected Nigerian Workforce. EuroEconomica, Vol 34 No 1.

[71] Versluis, C. & Hillegers, T. (2006). The Impact of Portfolio Re-Financing on Black-Scholes Call Option Valuation. Applied Financial Economics Letters, 2, 261 – 263. EBSCOhost Database.

[72] West III, G.P. & Bernhardt, J. N. (2009). An Ascendant View of Human Resources Management as a Critical Content Dimension in New Venture Strategy. Advances in Entrepreneurship, Firm Emergence and Growth, Volume 11, 103–135; Emerald Group Publishing Limited, ISSN: 1074-7540/doi:10.1108/S1074-7540(2009)0000011006.

[73] World Bank Data. (2017). Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations =CN [Accessed 21 July 2019].

[74] World Bank Data. (2018). Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations =CN [Accessed 21 July 2019].

[75] World Bank Data. (2019). Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations =CN [Accessed 21 July 2019].

[76] World Bank Data. (2020). Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations =CN [Accessed 21 July 2019].

[77] Yong LI Si & Gui-Fen, JIA. (2016). Study on Accounts Receivable Financing. Journal of Changchun University. Management College, Changchun University, Changchun, Jilin 130022, China.

[78] Zikmund, William G.; Babin, Barry J.; Carr, Jon C.; Adhikari, Atanu; Griffin, Mitch. (2013). Business Research Methods: A South-Asian Perspective, 8e, Cengage Learning. Perspective, 8e, Cengage Learning.